

Optionally Manned Technology Demonstrator



Readiness /Sustainment Concept

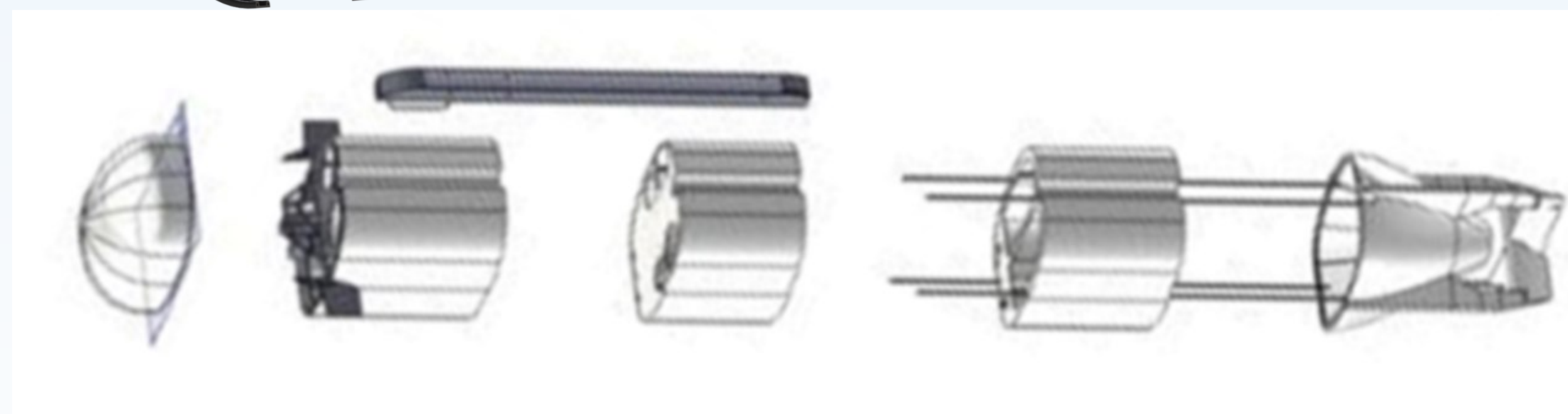
The Disruptive Technologies Lab enterprise (DTLe) was funded to produce a 3D printed model of a submersible for the FY16 DoN Print-a-thon. Through the success of this event the idea was born to 3D print the Navy's first full-scale hull form. While still in its early stages of the project the Optionally Manned Technology Demonstrator (OMTD) was able to be 3D printed as a technology demonstrator. Carderock is now funding a second version of OMTD capable of being towed, in our test facilities. A new design for the OMTD will be created and additional capabilities added based on lessons learned from the

Business Case for 3D printing of the OMTD:

- Reduction of systems components
- Reduction of design and fabrication cycle
- Hull design cycle 3-5 months
- 1-6 weeks to produce a hull
- Low cost encourages rapid new tech insertions
- Government control of the interface architecture
- Modular and reconfigurable
- Limited or reduced maintenance

The Technology:

- Structural and Materials testing
- Wireless energy
- Augmented reality systems
- Print = 30' base
- Printed at Oak Ridge National Labs on the Big Area Additive Manufacturing System (BAAMs) which is a Cincinnati Incorporated Model 100 ALPHA using ABS



Transition:

- Carderock Test Facilities in FY18
- Capable of fleet ready prototype in FY19
- UUV Design and implementation in FY20

Challenges:

- Strength/strain properties of AM material
- Porousness of ABS material
- Need to make multiple layer and bead passes stronger
- Cracking due to thermal expansion/contraction and parts being attached with different layer directions

